We Claim:

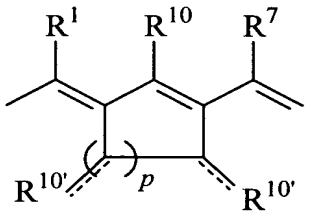
1. A mobility-modifying cyanine dye comprising: (i) a first substituted or unsubstituted parent heteroaromatic benzazole/benzazolium ring system having a linking moiety of the formula –L–LG, where L is a linker and LG is a linking group, attached to the heteroaromatic ring nitrogen; (ii) a second substituted or unsubstituted parent heteroaromatic benzazole/benzazolium ring system having a mobility-modifying moiety attached to the heteroaromatic ring nitrogen; and an electron delocalizing bridge connecting the first and second parent benzazole/benzazolium rings *via* their respective C2 carbons, wherein when said mobility-modifying moiety has a net charge of -2 or less or +1 or greater.

2. The mobility-modifying cyanine dye of Claim 1 in which the bridge is a compound selected from the group consisting of:

(B.1) $-(CR^1=CR^2)_k-(CR^3=CR^4)_l-(CR^5-CR^6)_m-CR^7=$

and

(B.2)



wherein:

k, *l*, and *m* are each independently integers from 0 to 1;

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each independently selected from the group consisting of hydrogen, halogen, –F, –Cl, –CN, $-CF_3$, (C_1-C_6) alkyl, (C_5-C_{14}) aryl or 5-14 membered heteroaryl;

R^{10} and $R^{10'}$ are each independently selected from the group consisting of hydrogen, oxygen, halogen, -F, -Cl, -CN, $-CF_3$, -OR, -SR, -NRR, (C_1-C_6) alkyl, (C_5-C_{14}) aryl or 5-14 membered heteroaryl, where each R is independently hydrogen or (C_1-C_6) alkyl; and

p is an integer from 0 to 2, where in structural formula (B.2), the dotted lines at substituents $R^{10'}$ represent bonds that may be independently either single bonds or a double bonds, depending upon the identities of the substituents.

3. The mobility-modifying cyanine dye of Claim 2 in which the bridge is a compound of structural formula (B.1).

4. The mobility-modifying cyanine dye of Claim 3 in which the sum of *k*, *l* and *m* is 2.

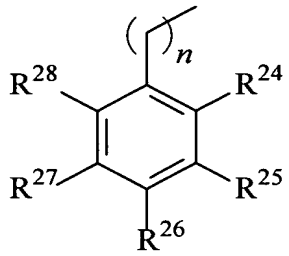
5. The mobility-modifying cyanine dye of Claim 2 in which the bridge is a compound of structural formula (B.1) wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each hydrogen.

6. The mobility-modifying cyanine dye of Claim 1 in which the bridge is –CH=CH–CH=CH–CH=.

7. The mobility-modifying cyanine dye of Claim 1 in which the mobility-modifying moiety has a net positive charge.

8. The mobility-modifying cyanine dye of Claim 1 in which the mobility-modifying moiety has a net negative charge.

9. The mobility-modifying cyanine dye of Claim 1 in which the mobility-modifying moiety has the structure:



or a salt thereof, wherein:

n is an integer from 1 to 6 (preferably 1 to 3);

R^{24}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{25} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups;

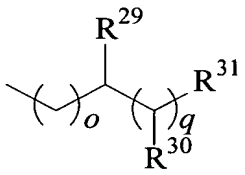
R^{25}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{24} or R^{26} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups;

R^{26}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{25} or R^{27} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups; and

R^{27}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{26} or R^{28} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups; and

R^{28}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{27} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups.

10. The mobility-modifying cyanine dye of Claim 1 in which the mobility-modifying moiety has the structure:



or a salt thereof, wherein:

o is an integer from 1 to 3;

q is an integer from 1 to 3;

R^{29} is a strong anionic substituent, $-S(O)_2O^-$ or $-O-S(O)_2O^-$,

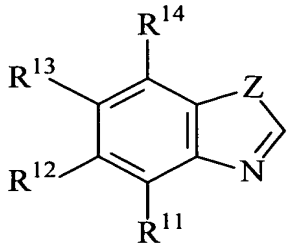
each R^{30} is independently selected from the group consisting of hydrogen a strong anionic substituent, $-S(O)_2O^-$ and $-O-S(O)_2O^-$; and

R^{31} is selected from the group consisting of hydrogen, a strong anionic substitutent, $-S(O)_2O^-$, $-O-S(O)_2O^-$ and $-CH_3$,

with the proviso that MM has a net charge of at least -2 at a pH in the range of about pH 6 to pH 10.

11. The mobility-modifying cyanine dye of Claim 1 in which the first and second heteroaromatic benzazole/benzazolium ring systems are the same.

12. The mobility-modifying cyanine dye of Claim 1 in which the first parent heteroaromatic benzazole/benzazolium ring system has the structure:



or a salt thereof, wherein:

Z is selected from the group consisting of -S-, -O-, -Se- and $-CR^8R^9-$, where R^8 and R^9 when taken alone, are each independently (C_1-C_6) alkyl, or when taken together are (C_4-C_5) alkyleno or (C_4-C_5) alkano;

R^{11}, R^{12}, R^{13} and R^{14}, when taken alone, are each independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_1-C_6) alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, (C_5-C_{10}) aryl, (C_5-C_{10}) aryl independently substituted with one or more W, (C_5-C_6) arylaryl, (C_5-C_6) arylaryl independently substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W; and

each W is independently -R, -X, =O, -OR, =S, -SR, -NRR, =NR, (C_1-C_6)

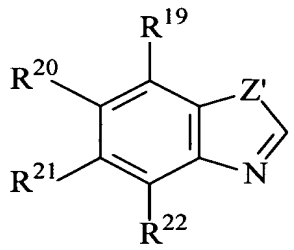
perhaloalkyl, -CX_3, -CN, -OCN, -SCN, -NO, -NO_2, =N_2, -N_3, -NHOH, -$S(O)_2R$, -C(O)R, -C(S)R, -C(O)OR', -C(S)OR', -C(O)SR', -C(S)SR', and -C(NR)NRR, wherein:

each X is independently a halogen;

each R is independently -H, -NR"R", -C(O)R", -$S(O_2)$R", (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and

each R' is independently (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl and (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and each R" is independently -H, (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arlyalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl.

13. The mobility-modifying cyanine dye of Claim 1 in which the second parent heteroaromatic benzazole/benzazolium ring system has the structure:



or a salt thereof, wherein:

Z' is selected from the group consisting of -S-, -O-, -Se- and -$CR^{8'}R^{9'}$, where $R^{8'}$and $R^{9'}$, when taken alone, are each independently (C_1-C_6) alkyl, or when taken together are (C_4-C_5) alkyleno or (C_4-C_5) alkano;

R^{19}, R^{20}, R^{21} and R^{22}, when taken alone, are each independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_1-C_6) alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl

independently substituted with one or more W, (C_5-C_{10}) aryl, (C_5-C_{10}) aryl independently substituted with one or more W, (C_5-C_6) arylaryl, (C_5-C_6) arylaryl independently substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R" are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W; and

each W is independently -R, -X, =O, -OR, =S, -SR, -NRR, =NR, (C_1-C_6) perhaloalkyl, -CX_3, -CN, -OCN, -SCN, -NO, -NO_2, =N_2, -N_3, -NHOH, -$S(O)_2R$, -C(O)R, -C(S)R, -C(O)OR', -C(S)OR', -C(O)SR', -C(S)SR', and -C(NR)NRR, wherein:

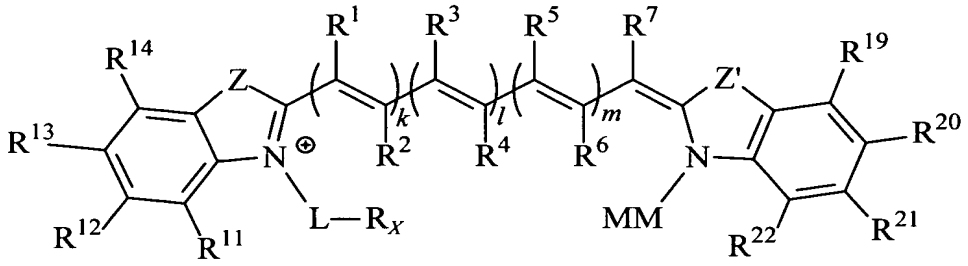
each X is independently a halogen;

each R is independently -H, -NR"R", -C(O)R", -$S(O_2)$R", (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and

each R' is independently (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl and (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and each R" is independently -H, (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arlyalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl.

14. A mobility-modifying cyanine dye according to Claim 1 in which the first and second heteroaromatic benzazole/benzazolium rings are each the same or different substituted or unsubstituted indoline/indolinium ring.

15. The mobility-modifying cyanine dye of Claim 1 which has the structure:



or a salt thereof, wherein:

k, *l*, and *m* are each independently integers from 0 to 1;

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each independently selected from the group consisting of hydrogen, halogen, –F, –Cl, –CN, $–CF_3$, $(C_1\text{-}C_6)$ alkyl, $(C_5\text{-}C_{14})$ aryl and 5-14 membered heteroaryl;

MM is a mobility-modifying moiety;

L is a linker;

R_x is a reactive functional group;

Z is selected from the group consisting of -S-, -O-, -Se- and $-CR^8R^9-$, where R^8 and R^9 when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

Z' is selected from the group consisting of -S-, -O-, -Se- and $-CR^{8'}R^{9'}$, where $R^{8'}$ and $R^{9'}$, when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

R^{11}, R^{12}, R^{13} and R^{14}, when taken alone, are each independently selected from the group consisting of hydrogen, $(C_1\text{-}C_6)$ alkyl, $(C_1\text{-}C_6)$ alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, $(C_5\text{-}C_{10})$ aryl, $(C_5\text{-}C_{10})$ aryl independently substituted with one or more W, $(C_5\text{-}C_6)$ arylaryl, $(C_5\text{-}C_6)$ arylaryl independently

substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

R^{19}, R^{20}, R^{21} and R^{22}, when taken alone, are each independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_1-C_6) alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, (C_5-C_{10}) aryl, (C_5-C_{10}) aryl independently substituted with one or more W, (C_5-C_6) arylaryl, (C_5-C_6) arylaryl independently substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

each W is independently -R, -X, =O, -OR, =S, -SR, -NRR, =NR, (C_1-C_6)

perhaloalkyl, -CX_3, -CN, -OCN, -SCN, -NO, -NO_2, =N_2, -N_3, -NHOH, -$S(O)_2R$, -C(O)R, -C(S)R, -C(O)OR', -C(S)OR', -C(O)SR', -C(S)SR', and -C(NR)NRR, wherein:

each X is independently a halogen;

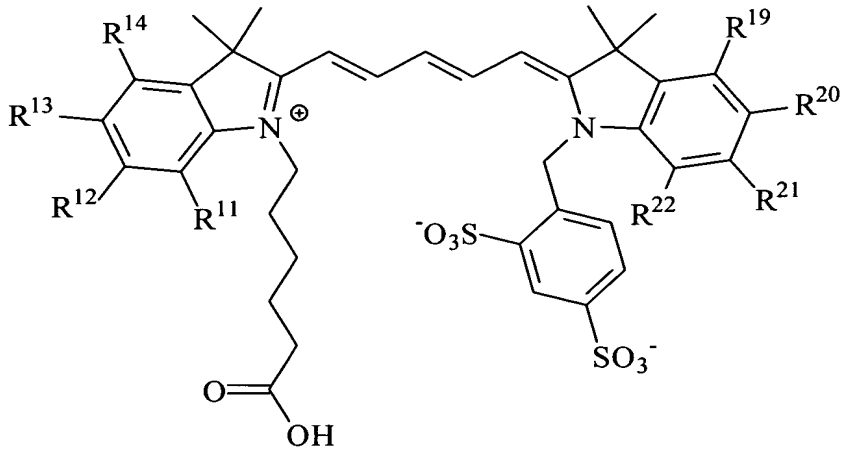
each R is independently -H, -NR"R", -C(O)R", -$S(O_2)$R", (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and

each R' is independently (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl and (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and each R" is independently -H, (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arlyalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl.

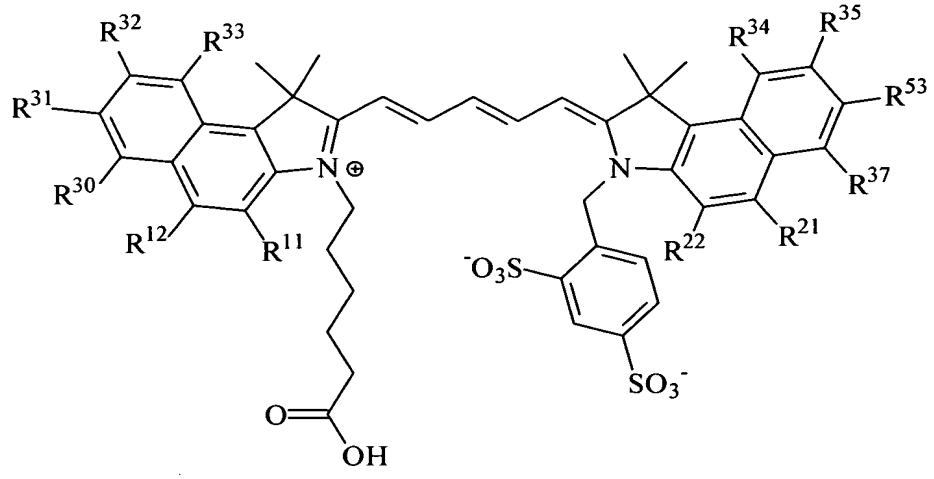
16. The mobility-modifying cyanine dye of Claim 15 in which Z is –NR^8R^9–, where R^8 and R^9 are each independently (C_1-C_6) alkano; and Z' is –$NR^{8'}R^{9'}$–, where $R^{8'}$ and $R^{9'}$are each independently (C_1-C_6) alkano.

17. The mobility-modifying cyanine dye of Claim 15 which is selected from the group consisting of:

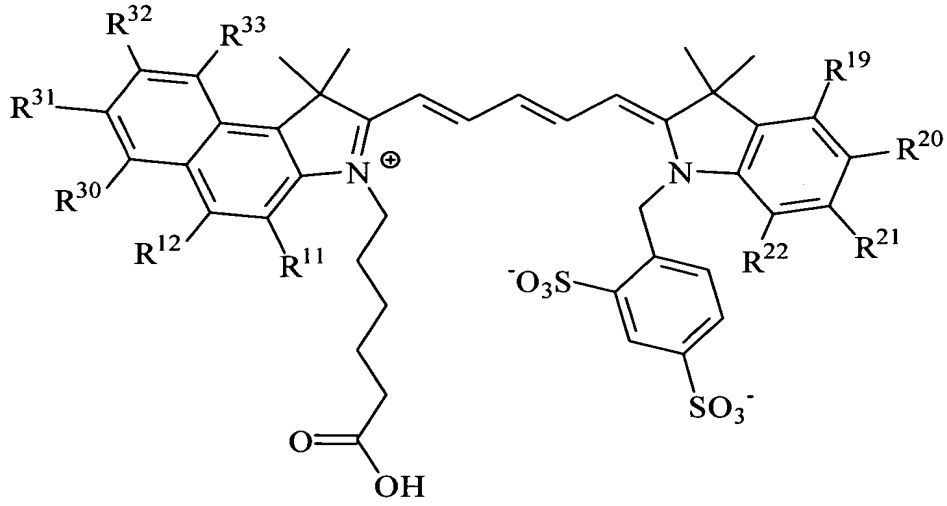
(I.D)



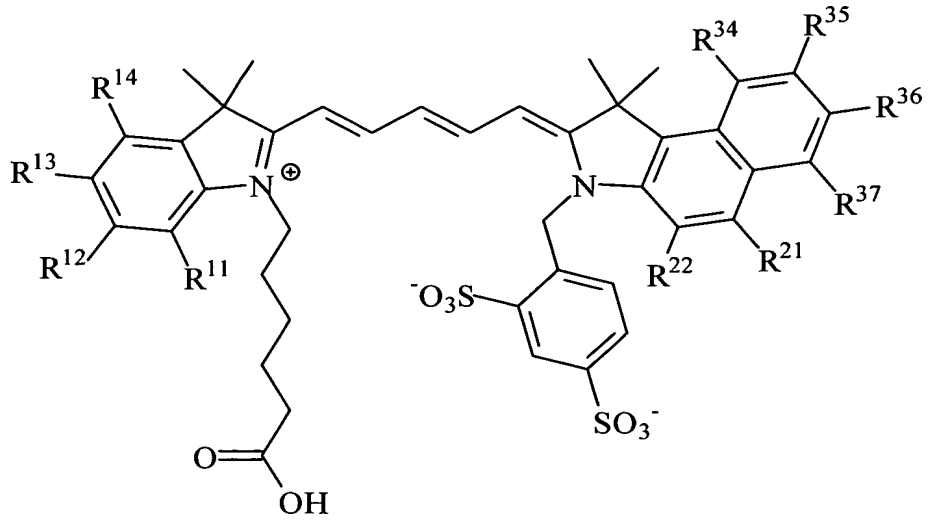
(I.E)


R32
R33
R31
R30
R12
R11
N⊕
O
OH
R34
R35
R53
R37
R22
R21
N
-O3S
SO3-

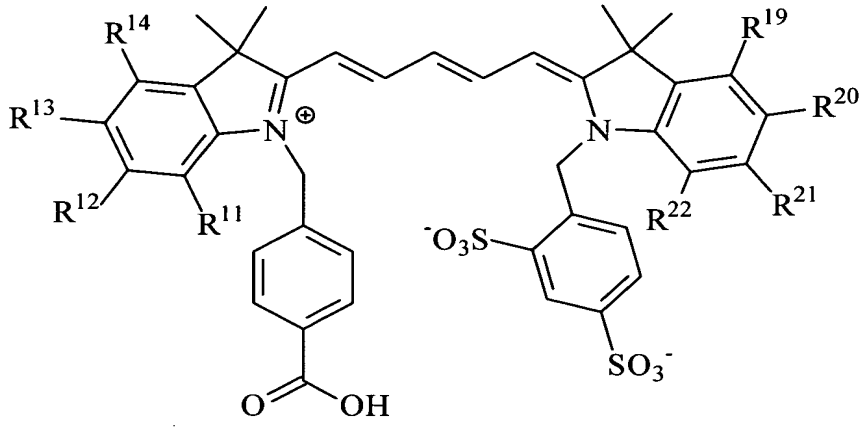
(I.F)


R32
R33
R31
R30
R12
R11
N⊕
O
OH
R19
R20
R21
R22
N
-O3S
SO3-

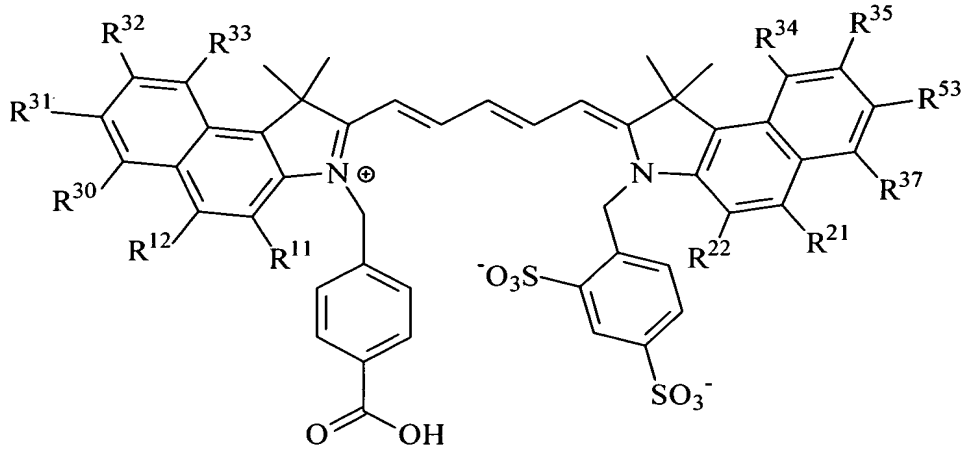
(I.G)



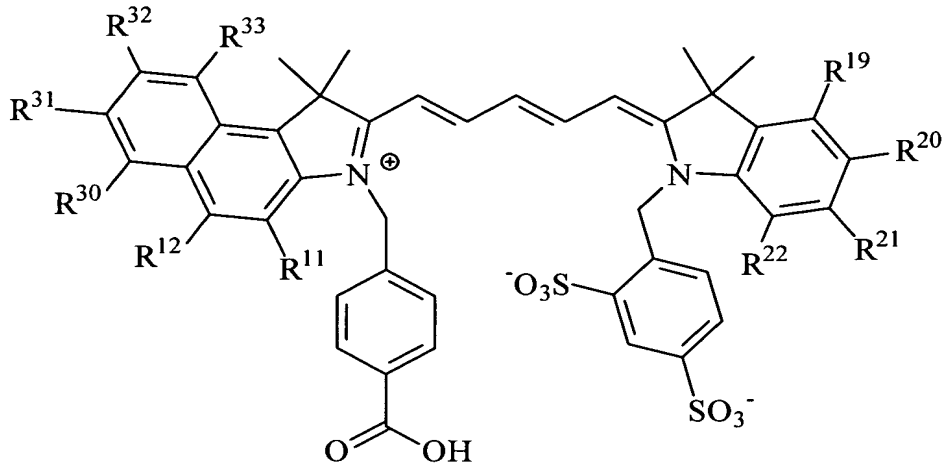
(I.H)



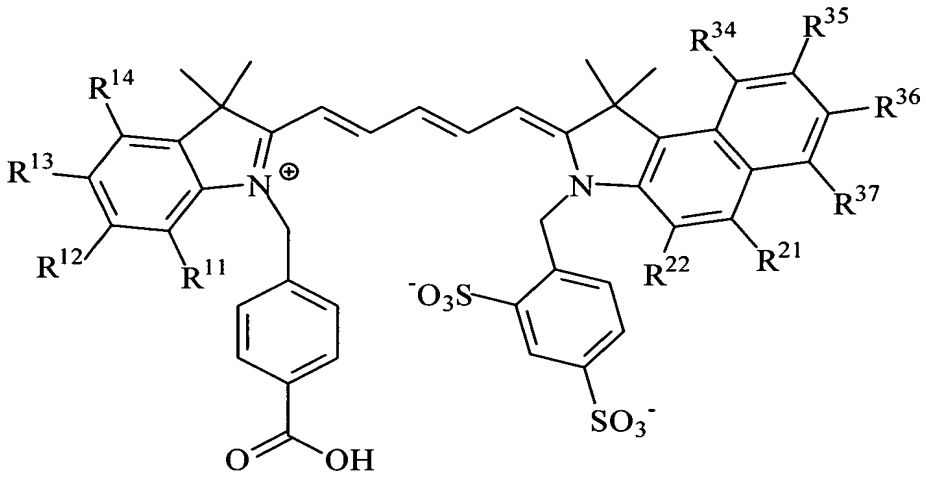
(I.I)



(I.J)



(I.K)



or a salt thereof, wherein:

R^{11}, R^{12}, R^{13}, R^{14}, R^{19}, R^{20}, R^{21}, R^{22}, R^{30}, R^{31}, R^{32}, R^{33}, R^{34}, R^{35}, R^{36} and R^{37} are each independently selected from the group consisting of hydrogen, $-S(O)_2O^-$ and $-O-S(O)_2O^-$.

18. A labeled nucleoside/tide or nucleoside/tide analog having the structure:

$$NUC–L'–R^{41}–L–D$$

or a salt thereof, wherein:

D is a mobility-modifying cyanine dye chromophore;

L is a first linker which is attached to D at a heteroaromatic ring nitrogen;

R^{41} is a covalent linkage;

NUC is a nucleoside/tide or nucleoside/tide analog; and

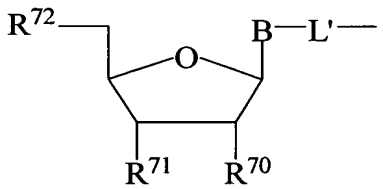
L' is a second linker which is attached to the nucleobase or sugar moiety of NUC.

19. The labeled nucleoside/tide or nucleoside/tide analog of Claim 18 which is enzymatically incorporable.

20. The labeled nucleoside/tide or nucleoside/tide analog of Claim 18 which is a terminator.

21. The labeled nucleoside/tide or nucleoside/tide analog of Claim 18 which is enzymatically extendable.

22. The labeled nucleoside/tide or nucleoside/tide analog of Claim 18 in which –L'–NUC taken together has the structure:

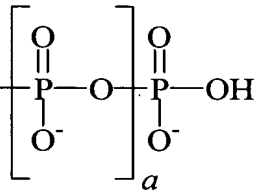


or a salt thereof, wherein:

B is a nucleobase;

L' is (C_1-C_{20}) alkyldiyl, (C_1-C_{20}) alkyleno, (C_2-C_{20}) alkyno, (C_2-C_{20}) alkeno 2-20 membered heteroalkyldiyl, 2-20 membered heteroalkyleno, 2-20 membered heteroalkyno or 2-20 membered heteroalkeno;

R^{70} and R^{71},when taken alone, are each independently selected from the group consisting of hydrogen, hydroxyl and a moiety which blocks polymerase-mediated template-directed polymerization, or when taken together form a bond such that the illustrated sugar is 2',3'-didehydroribose; and

R^{72} is selected from the group consisting of hydroxyl, a phosphate ester having the formula  , where *a* is an integer from 0 to 2 and a phosphate ester analog.

23. The labeled nucleoside/tide or nucleoside/tide analog of Claim 22 in which L' is selected from the group consisting of:

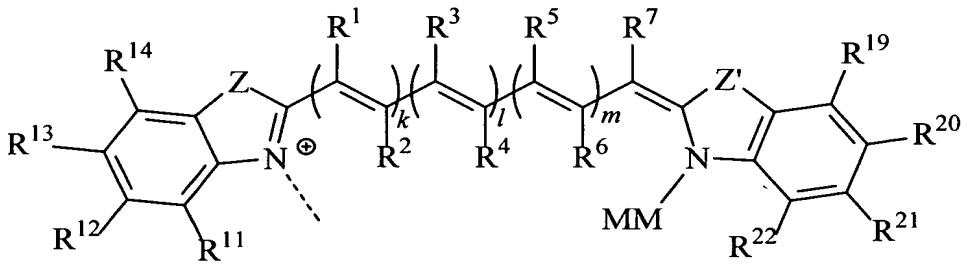
–C≡C–CH_2–, where the terminal *sp* carbon is covalently attached to nucleobase B and the terminal methylene (sp^3) carbon is covalently attached to R^{41}; and

–C≡C–CH_2–O–CH_2–CH_2–NR^{47}–R^{48}–, where R^{47} is hydrogen or (C_1-C_6) alkyl and R^{48} is –C(O)–$(CH_2)_r$–, –C(O)–CHR^{49}–, –C(O)–C≡C–CH_2– or –C(O)–ϕ–$(CH_2)_r$–, where each *r* is independently an integer from 1 to 5 and ϕ is C_6 aryldiyl or 6-membered heteroaryldiyl and R^{49} is hydrogen, (C_1-C_6) alkyl or a side chain of an encoding or non-encoding amino acid, and where the terminal *sp* carbon is covalently attached to nucleobase B and the other terminal group is covalently attached to R^{41}.

24. The labeled nucleoside/tide or nucleoside/tide analog of Claim 22 in which nucleobase B is a purine, a 7-deazapurine, a pyrimidine, a normal nucleobase or a common

analog of a normal nucleobase.

25. The labeled nucleoside/tide or nucleoside/tide analog of Claim 18 in which D has the structure:



or a salt thereof, wherein:

k, *l*, and *m* are each independently integers from 0 to 1;

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each independently selected from the group consisting of hydrogen, halogen, –F, –Cl, –CN, $–CF_3$, $(C_1\text{-}C_6)$ alkyl, $(C_5\text{-}C_{14})$ aryl or 5-14 membered heteroaryl;

MM is a mobility-modifying moiety;

Z is selected from the group consisting of -S-, -O-, -Se- and $-CR^8R^9-$, where R^8 and R^9 when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

Z' is selected from the group consisting of -S-, -O-, -Se- and $-CR^{8'}R^{9'}$, where $R^{8'}$and $R^{9'}$, when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

R^{11}, R^{12}, R^{13} and R^{14}, when taken alone, are each independently selected from the group consisting of hydrogen, $(C_1\text{-}C_6)$ alkyl, $(C_1\text{-}C_6)$ alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, $(C_5\text{-}C_{10})$ aryl, $(C_5\text{-}C_{10})$ aryl independently

substituted with one or more W, (C_5-C_6) arylaryl, (C_5-C_6) arylaryl independently substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

R^{19}, R^{20}, R^{21} and R^{22}, when taken alone, are each independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_1-C_6) alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, (C_5-C_{10}) aryl, (C_5-C_{10}) aryl independently substituted with one or more W, (C_5-C_6) arylaryl, (C_5-C_6) arylaryl independently substituted with one or more W, (C_6-C_{16}) arylalkyl, (C_6-C_{16}) independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of (C_6-C_{10}) aryleno, (C_6-C_{10}) aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

each W is independently -R, -X, =O, -OR, =S, -SR, -NRR, =NR, (C_1-C_6) perhaloalkyl, -CX_3, -CN, -OCN, -SCN, -NO, -NO_2, =N_2, -N_3, -NHOH, -$S(O)_2R$, -C(O)R, -C(S)R, -C(O)OR', -C(S)OR', -C(O)SR', -C(S)SR', and -C(NR)NRR, wherein:

each X is independently a halogen;

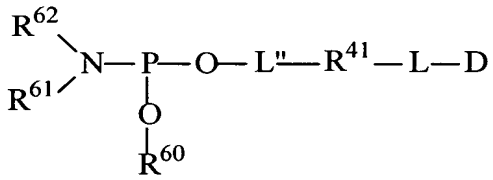
each R is independently -H, -NR"R", -C(O)R", -$S(O_2)$R", (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl;

each R' is independently (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl and (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and each R" is independently -H, (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arlyalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and

the dotted line at the heteroaromatic ring nitrogen indicates the point of attachment of linker L.

26. A mobility-modifying phosphoramidite reagent having the structure:

(III)



or a salt thereof, wherein:

N, O and P are nitrogen, oxygen and phosphorous, respectively;

D is a mobility-modifying dye chromophore or a protected derivative thereof;

L is a first linker;

R^{41} is a bond or a covalent linkage;

L" is a bond or a second linker;

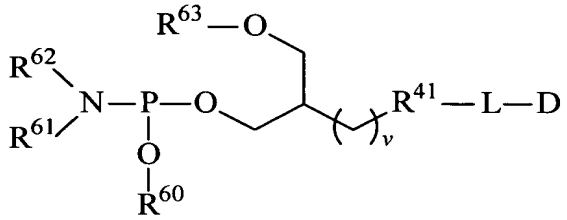
R^{60} is a phosphite ester protecting group;

R^{61}, when taken alone, is selected from the group consisting of (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_3-C_{10}) cycloalkyl, (C_5-C_{20}) aryl and (C_6-C_{26}) arylalkyl, or when taken together with R^{62} forms a straight-chain or branched (C_2-C_{10}) alkyleno or a straight-chain or branched 2-10 membered heteroalkyleno; and

R^{62}, when taken alone, is selected from the group consisting of (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_3-C_{10}) cycloalkyl, (C_5-C_{20}) aryl and (C_6-C_{26}) arylalkyl, or when taken together with R^{61} forms a straight-chain or branched (C_2-C_{10}) alkyleno or a straight-chain or branched 2-10 membered heteroalkyleno.

27. The mobility-modifying phosphoramidite reagent according to Claim 26 which has the structure:

(III.A)



wherein:

N, P and O are nitrogen, phosphorous and oxygen, respectively;

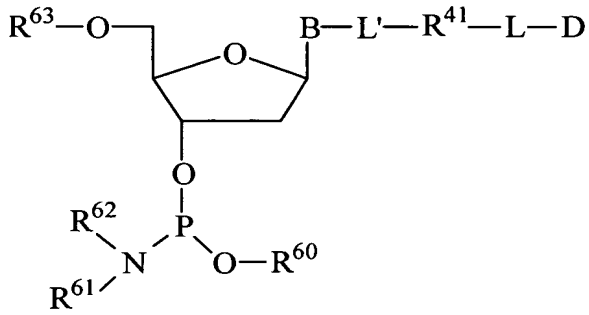
R^{41}, L, D, R^{60}, R^{61} and R^{62} are as previously defined;

R^{63} is hydrogen or an acid-labile hydroxyl protecting group; and

v is an integer from 1 to 30.

28. A mobility-modifying phosphoramidite reagent having the structure:

(IV)



or a salt thereof, wherein:

O, P and N are oxygen, phosphorous and nitrogen, respectively;

B is a nucleobase or a protected derivative thereof;

D is a mobility-modifying dye chromophore or a protected derivative thereof;

L is a first linker which is attached to D at a heteroaromatic ring nitrogen;

R^{41} is a bond or a covalent linkage;

L' is a bond or a second linker;

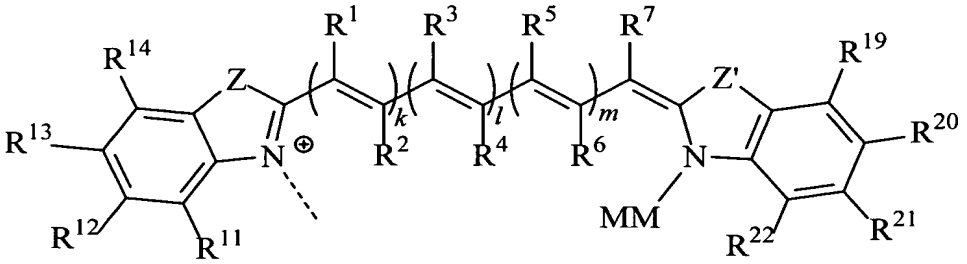
R^{60} is a phosphite ester protecting group;

R^{61}, when taken alone, is selected from the group consisting of (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_3-C_{10}) cycloalkyl, (C_5-C_{20}) aryl and (C_6-C_{26}) arylalkyl, or when taken together with R^{62} forms a straight-chain or branched (C_2-C_{10}) alkyleno or a straight-chain or branched 2-10 membered heteroalkyleno; and

R^{62}, when taken alone, is selected from the group consisting of (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_3-C_{10}) cycloalkyl, (C_5-C_{20}) aryl and (C_6-C_{26}) arylalkyl, or when taken together with R^{61} forms a straight-chain or branched (C_2-C_{10}) alkyleno or a straight-chain or branched 2-10 membered heteroalkyleno; and

R^{63} is hydrogen or an acid-labile hydroxyl protecting group

29. The mobility-modifying phosphoramidite reagent according to Claim 26, 27 or 28 in which D has the structure:



or a salt thereof, wherein:

k, *l*, and *m* are each independently integers from 0 to 1;

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each independently selected from the group consisting of hydrogen, halogen, –F, –Cl, –CN, $–CF_3$, $(C_1\text{-}C_6)$ alkyl, $(C_5\text{-}C_{14})$ aryl or 5-14 membered heteroaryl;

MM is a mobility-modifying moiety;

Z is selected from the group consisting of -S-, -O-, -Se- and $-CR^8R^9-$, where R^8 and R^9 when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

Z' is selected from the group consisting of -S-, -O-, -Se- and $-CR^{8'}R^{9'}$, where $R^{8'}$and $R^{9'}$, when taken alone, are each independently $(C_1\text{-}C_6)$ alkyl, or when taken together are $(C_4\text{-}C_5)$ alkyleno or $(C_4\text{-}C_5)$ alkano;

R^{11}, R^{12}, R^{13} and R^{14}, when taken alone, are each independently selected from the group consisting of hydrogen, $(C_1\text{-}C_6)$ alkyl, $(C_1\text{-}C_6)$ alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, $(C_5\text{-}C_{10})$ aryl, $(C_5\text{-}C_{10})$ aryl independently substituted with one or more W, $(C_5\text{-}C_6)$ arylaryl, $(C_5\text{-}C_6)$ arylaryl independently substituted with one or more W, $(C_6\text{-}C_{16})$ arylalkyl, $(C_6\text{-}C_{16})$ independently substituted with

one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of $(C_6\text{-}C_{10})$ aryleno, $(C_6\text{-}C_{10})$ aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

R^{19}, R^{20}, R^{21} and R^{22}, when taken alone, are each independently selected from the group consisting of hydrogen, $(C_1\text{-}C_6)$ alkyl, $(C_1\text{-}C_6)$ alkyl independently substituted with one or more W, 2-6 membered heteroalkyl, 2-6 membered heteroalkyl independently substituted with one or more W, $(C_5\text{-}C_{10})$ aryl, $(C_5\text{-}C_{10})$ aryl independently substituted with one or more W, $(C_5\text{-}C_6)$ arylaryl, $(C_5\text{-}C_6)$ arylaryl independently substituted with one or more W, $(C_6\text{-}C_{16})$ arylalkyl, $(C_6\text{-}C_{16})$ independently substituted with one or more W, 6-16 membered arylheteroalkyl, 6-16 membered arylheteroalkyl independently substituted with one or more W, 5-10 membered heteroaryl, 5-10 membered heteroaryl independently substituted with one or more W, 5-6 membered heteroaryl-heteroaryl, 5-6 membered heteroaryl independently substituted with one or more W, 6-16 membered heteroarylalkyl, 6-16 membered heteroarylalkyl independently substituted with one or more W, 6-16 membered heteroaryl-heteroalkyl and 6-16 membered heteroaryl-heteroalkyl independently substituted with one or more W,

or when taken together with an adjacent R^n are each independently selected from the group consisting of $(C_6\text{-}C_{10})$ aryleno, $(C_6\text{-}C_{10})$ aryleno independently substituted with one or more W, 6-10 membered heteroaryleno and 6-10 membered heteroaryleno independently substituted with one or more W;

each W is independently -R, -X, =O, -OR, =S, -SR, -NRR, =NR, $(C_1\text{-}C_6)$ perhaloalkyl, $-CX_3$, -CN, -OCN, -SCN, -NO, $-NO_2$, $=N_2$, $-N_3$, -NHOH, $-S(O)_2R$, -C(O)R,

-C(S)R, -C(O)OR', -C(S)OR', -C(O)SR', -C(S)SR', and -C(NR)NRR, wherein:

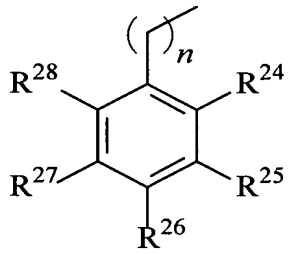
each X is independently a halogen;

each R is independently -H, -NR"R", -C(O)R", -S(O_2)R", (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl;

each R' is independently (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkenyl and (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arylalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and each R" is independently -H, (C_1-C_6) alkyl, (C_1-C_6) alkanyl, (C_2-C_6) alkynyl, (C_5-C_{10}) aryl, (C_6-C_{16}) arlyalkyl, 5-10 membered heteroaryl or 6-16 membered heteroarylalkyl; and

the dotted line at the heteroaromatic ring nitrogen indicates the point of attachment of linker L.

30. The mobility-modifying phosphoramidite reagent of Claim 29 in which MM has the structure:



or a salt thereof, wherein:

n is an integer from 1 to 6 (preferably 1 to 3);

R^{24}, when taken alone, is hydrogen, a strong anionic substituent, –S($O)_2O^-$, or –O–S($O)_2O^-$, or when taken together with R^{25} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, –S($O)_2O^-$, or –O–S($O)_2O^-$ groups;

R^{25}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{24} or R^{26} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups;

R^{26}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{25} or R^{27} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups; and

R^{27}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{26} or R^{28} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups; and

R^{28}, when taken alone, is hydrogen, a strong anionic substituent, $-S(O)_2O^-$, or $-O-S(O)_2O^-$, or when taken together with R^{27} is a benzo group or a benzo group independently substituted with one or more strong anionic substituents, $-S(O)_2O^-$, or $-O-S(O)_2O^-$ groups.

31. The mobility-modifying phosphoramidite reagent according to Claim 26, 27 or 28 in which L is $-CH_2-CH_2-CH_2-CH_2-CH_2-$ (pentano).

32. The mobility-modifying phosphoramidite reagent according to Claim 26, 27 or 28 in which R^{41} is a covalent linkage formed upon the reaction between an electrophile and a nucleophile.

33. The mobility-modifying phosphoramidite reagent according to Claim 31 in which R^{41} has the structure $-C(O)-NR^{56}-$, where R^{56} is hydrogen or (C_1-C_6) alkyl.

34. A polynucleotide labeled with a mobility-modifying dye according to Claim 1.

35. A method of generating a labeled primer extension product, comprising the step of enzymatically extending a primer-target hybrid in the presence of a mixture of enzymatically-extendable nucleotides capable of supporting continuous primer extension and a terminator, wherein said primer or said terminator is labeled with a mobility-modifying dye according to Claim 1.

36. The method of Claim 35 in which the terminator is a mixture of four different terminators, one which terminates at a template A, one which terminates at a template G, one which terminates at a template C and one which terminates at a template T or U and wherein at least one of the terminators is labeled with a mobility-modifying dye according to Claim 1.

37. The method of Claim 36 in which each of the four different terminators is labeled with a different, spectrally-resolvable fluorophore, and one of the terminators is selected from the group consisting of Compound **29** and Compound **32**.

38. A kit for generating a labeled primer extension product, comprising enzymatically-extendable nucleotides capable of supporting continuous primer extension and a terminator, wherein said primer or said terminator is labeled with a mobility-modifying cyanine dye according to Claim 1.

39. The kit of Claim 38 in which the terminator is a set of four different mobility-modified terminators, one which terminates at a template A, one which terminates at a template G, one which terminates at a template C and one which terminates at a template T or U.

40. The kit of Claim 39 in which the set of four different terminators is a set of mobility-matched terminators.

41. The kit of Claim 39 in which the set of mobility-matched terminators

comprises Compounds **31**, **32**, **33** and **34**.